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## Institutional inertia and climate change: a review of the new institutionalist literature

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### Abstract

Climate scientists and policy analysts alike have repeatedly called for urgent mitigating action to avoid the most adverse effects of climate change. However, within the political arena this action is largely lacking. In order to understand this discrepancy, we consider the institutions in climate change policy to be of central importance. Renewed interest in institutions has been generated to a great extent by ‘new institutionalism’, a field of research combining economics, political science and sociology, and

which has become increasingly popular since the 1980s. The tendency of institutions to resist change and thereby stabilising policy can be understood by using the concept of institutional inertia. Our review of the new institutionalist literature on climate change identifies five main mechanisms that generate institutional inertia: costs, uncertainty, path dependence, power and legitimacy. Means of addressing these mechanisms are proposed by referring to the work on institutional entrepreneurship and institutional work. A focus on the mechanisms that generate and regenerate institutional inertia is beneficial for future research on institutions and climate change, as it can be used to study bottlenecks for action and address more clearly the urgency of necessary policy interventions.

## **INTRODUCTION**

There are currently strong pleas from the climate science and policy analysis communities to quickly adopt measures for the mitigation of anthropogenic climate change. Glaciologist Richard Allen states that “[i]f you want to be able to head off a few trillions of damages per year a few decades out, you need to start now” (Reference 1, p. 1230). Nevertheless, current climate change policy is significantly lagging behind the scientific evidence at hand. This discrepancy between science and policy can be considered one of the most pressing problems within climate change policy.<sup>2</sup> This is intensified further by a parallel time lag in the climatic system. Because of long-term stock and flow relationships,<sup>3</sup> many of the adverse impacts of climate change are delayed – concealed links between cause and effect in the climate system further lead to slow institutional responses to climate change.

To address these institutional time lags, we review the ‘new institutionalist’ literature on climate change and examine the explanations for the slow movement of institutions. New institutionalism is a wide collection of research combining political science, sociology and economics and has grown in popularity from the 1980s onwards.<sup>4-7</sup> By emphasising that social problems cannot be directly reduced to the level of the individual,<sup>4</sup> new institutionalism can be seen as having emerged in reaction to a seemingly narrow focus on human agency and behaviour existing in the literature at the time.<sup>8</sup> In the field of climate change and environmental policy, the new institutionalist approach has been widely applied to assess how both formal and informal institutions influence and shape the decisions made by organisations and policy-makers (e.g. Reference 9-11).

In this review we focus on the concept of institutional inertia. Institutional inertia refers to the “‘stickiness’” (Reference 12, p. 8) of institutions, or to how they resist change. Arguably, this can be seen as a defining trait of institutions, as they embody stability and predictability to a considerable extent.<sup>13</sup> We identify five main mechanisms of institutional inertia existing in the new institutionalist literature: (1) cost; (2) uncertainty; (3) path dependence; (4) power; and (5) legitimacy. Reviewing how the new institutionalist literature on climate change deals with the mechanisms generating and regenerating inertia is therefore highly relevant, particularly for making sense of the challenges of policy and governance to address climate change in a timely manner. This review article contributes to the discussion about the urgency of climate change policy by pinpointing bottlenecks for prompt policy action.

## **INSTITUTIONAL INERTIA AND CLIMATE CHANGE**

In this review paper we treat institutional inertia as the inability of institutions to formulate timely responses to anthropogenic climate change. The key consequence of institutional inertia is that GHG emissions remain on the rise<sup>14</sup> despite apparent efforts at cementing multilateral agreements to combat climate change.<sup>15</sup> In addition, the climatic system is itself characterised by time lags, generated by the long lifetime of carbon dioxide (CO<sub>2</sub>) in the atmosphere. According to estimations, the lifetime of fossil fuel CO<sub>2</sub> can be as long as “300 years, plus 25% that lasts forever” (Reference 16, p. 5). Another

source of lag is the thermal inertia of ocean reservoirs. Even if all GHG emissions had ended in 2000, the heat of the ocean would have warmed the atmosphere by 0.6°C by the end of the century.<sup>1</sup> The resilience of the climate problem is based on the fact that once enough GHGs have been emitted to cause serious climate change, it is difficult or even impossible to reverse the process.<sup>17</sup> The result of the lag combined with resilience is that past emissions have already contributed to climatic change in the present, while present emissions are confronting future generations with additional change.

If it is assumed that responsible governments tackle the most difficult of public policy problems, then inert climate change policy presents a compelling paradox.<sup>18, 19</sup> Despite the scientific evidence, not much concerted policy activity is taking place. This motivates an explicit focus on the interfaces between inertia and the international political architecture (cf. Reference 20). Yet, while the absence of emission reduction targets-based outcomes in part follows the logic of a global commons tragedy, thus reinvigorating interest in the neo-realist approach to international relations (e.g. Reference 21), inertia is simultaneously mediated by several institutional factors that slow down or hinder progressive policy action.

By viewing institutional inertia as the central organising principle around which the issue of inadequate climate policy revolves, a focus on the mechanisms which sustain inert institutional responses to climate change is put centre-stage. This requires diagnoses of the institutional characteristics of what works in devising appropriate policy responses,<sup>22</sup> or conversely which institutions fail to confront these underlying mechanisms. Diagnostic research depends to a large extent on which institutional approach is used, particularly when such research is divided along analytical or prescriptive lines.<sup>23</sup> To provide for diversity in this respect, the following section introduces new institutionalism as a framework for investigation.

## **NEW INSTITUTIONALIST EXPLANATIONS FOR INERTIA**

New institutionalism is often categorised into three separate strands: rational choice institutionalism, historical institutionalism and sociological institutionalism.<sup>24</sup> These three strands embody different theoretical assumptions of what constitutes an institution and the relationship between institutions and behaviour. Therefore, the new institutionalist literature presents several explanations for what generates institutional inertia. Despite their differences, however, there have been attempts at cross-fertilisation by combining insights from the three strands (e.g. Reference 25). Next, we briefly discuss these individual strands and describe their approaches to institutions.

Rational choice institutionalism (RCI) generally conceives institutions as rules, both formal and informal, which ensure the survival of a regime or an organisation. Institutions can essentially be seen as the rational outcome of what actors want them to do. The key motivation for institutional adherence is that institutions are expected to maximise individual gain by lowering transaction costs, thereby minimising collective action problems.<sup>26, 27</sup> Similar to RCI, historical institutionalism (HI) envisages institutions as an assemblage of formal and informal rules and norms, but it does not regard them as existing independently from actors. In HI, it is instead suggested that the organisational makeup of the polity structures the incentives, attitudes and behaviours of actors, and that institutions are reproduced along circumscribed policy paths.<sup>12, 28</sup> Sociological institutionalism (SI) depicts institutions as a collection of cultural artefacts: norms, values, routines, scripts and symbols.<sup>5, 6</sup> SI emphasises the socialising force of these institutions, which in turn determine the extent to which behaviour is legitimate or appropriate. Consequently, the choices and preferences of actors are closely tied to institutions.

In particular RCI stands out amongst HI and SI because of its assumption that institutional inertia can be solved by the calculated attempt to satisfy private interests. This is in par with the literature on international relations, which distinguishes rationalist (RCI) from constructivist (HI and SI) approaches to understanding conflict and cooperation between states and multilateral power blocs.<sup>29</sup> In HI and SI climate change is seen as a social construct, a view which is incommensurate with the 'rational agenda' of RCI. Constructivism presupposes that institutional inertia in international climate policy is a function of how climate change is represented in existing problem definitions and framings, not to mention the politicisation of uncertainty.<sup>30</sup> Yet, the causes of current climate policy failures exist equally on the national and sub-national level, across sites of political struggle between incumbent and subordinate groups.<sup>31</sup>

### **Mechanisms of institutional inertia**

We use the new institutionalist literature to examine explanations for inertia that stretch beyond the explicit division between the three strands discussed earlier (cf. Reference 24). The selected articles have two main common traits: a) they draw upon the central understandings of the new institutionalist approaches discussed above with reference to climate change; and b) shed light on the slow movement of institutions. Based on our review, we present five mechanisms of institutional inertia found in the new institutionalist literature on climate change. The selected mechanisms summarise the central explanations for institutional inertia in the climate change policy context and additionally display the breadth of new institutional theory. Costs, the first mechanism, demonstrate that while collective action is a prerequisite to urgent climate action, institutional constraints limit the incentive for actors to collaborate. Costs of collaboration are tightly coupled to an array of uncertainties, the second mechanism. These relate to the unpredictability of climate change and how we make sense of it as well as the challenges of calculating benefits accrued from future investments. Yet, possible courses of climate change mitigation are dependent on existing paths and relationships of power in the international political arena, representing the third and fourth mechanism respectively. These two mechanisms influence the range of possibilities to politically address climate change. The fifth mechanism looks at whether climate change mitigation represents a legitimate course of action or inaction and how different policy options are made acceptable.

#### *Costs*

A central mechanism of institutional inertia in the new institutionalist literature is the cost of implementing mitigative climate policy. In her study of the 'Cities for Climate Protection' in the United States (US), Betsill<sup>32</sup> suggests that the capacity for local governments to take action against climate change is restricted by the high costs of co-ordinating the work between local departments as well as general budgetary constraints. On a general level, climate change is seen in the literature as a classic problem of public goods provision. Institutions maximise efficacy by lowering the costs for coordinating the service of a common goal, understood here as collective adherence of actors to maximise gain. Since climate change does not immediately conflict with common goal attainment, plausibly because adverse effects are delayed, there is little individual incentive to bear the costs of collective action in mitigation. The literature therefore views institutional inertia in terms of costs in bottom-up terms, as opposed to structural constraints (e.g. Reference 33 and Reference 34) – institutions are in other words often conceptualised as rules that influence the behaviour of actors. Distorted incentives through geographically and temporally displaced consequences as well as a decentralised enforcement of rules cause institutional inertia.<sup>35</sup>

More specifically, costs can within the literature be divided into two main subgroups: costs of 'free-ridership' and 'transaction costs'. Free-ridership, where a large number of dispersed actors create a

rational individual incentive for inaction, is considered the primary barrier to institutional efficacy in large-scale collective action problems. It is argued that in order to solve these collective action problems, climate change can only be addressed by an assurance that individual efforts will be matched by all in the group.<sup>34,36</sup> Additionally, the complexity of creating and adjusting frameworks for global mitigation is subject to so called endowment effects, where the structure of the prevailing institutional regime affects the preconceived basis for rational action. Transaction costs, on the other hand, are a direct result of inefficiencies in communication and negotiation required to change the status-quo of coordination action towards resolving a complex problem.<sup>34,37</sup> Institutions formed under the coordination of private interests persist, because they are economically efficient in serving their original purpose.<sup>37</sup> However, the aggregate effects of efficiently coordinated private interests are not necessarily socially optimal. Transaction costs, in the form of barriers to coordination, are a significant hindrance to instigating change in an existing regime.

### *Uncertainty*

The 'large-n' global-scale problem of public goods creates structural inertias beyond costs.<sup>31</sup> Institutions are tasked with addressing a real and increasing probability that adverse climate change effects will be both extreme and irreversible. Yet, some parts of the new institutionalist analysis views the fundamentally unpredictable catastrophic climate change no differently from rational calculations of risk.<sup>38</sup> Given incomplete information, postponement of policy action on climate change remains a rational course of action due to the 'regret potential' of investing in possibly 'unneeded' mitigation technology.<sup>39</sup> The uncertainty of shocks and tipping points makes systemic discontinuities fundamentally unpredictable, and therefore unmodelable, phenomena. Uncertainty is thus closely linked to the definition and framing of climate change, or how we make sense of the problem. The mechanism of structural uncertainty, under which the only certainty is that ex-ante structural change in the climate regime is unpredictable, is a potent force generating and reinforcing institutional inertia.<sup>40</sup>

When uncertainty and unpredictability prevail, the process of defining and conceptualising climate change becomes of great importance. Vlassopoulous highlights that the definitional struggle of climate change within the Kyoto Protocol – mostly along the lines of seeing it either as an environmental or social problem – may hinder the creation of "new institutional equilibriums...and, consequently, policymaking cannot follow" (Reference 41, p. 104). The lack of clear definitions, or a common language, that help make sense of the problem at hand constitutes a significant obstacle to achieving institutional change.

One way of addressing uncertainty of climate change is to employ the economic discount rate (see Reference 42 and Reference 43). The discount rate enables intertemporal comparisons of value by highlighting how actors appreciate future events vis-à-vis the present. The discount rate illustrates rational yet divergent and incompatible conclusions about the urgency of action. Reliance on discounting fails to present clear timely parameters for climate policy, instead creating a system that promotes systemic inertia regardless of the rate employed.<sup>44</sup> Significant risk of catastrophic outcomes, which would render an aggressive strategy the most rational one, is evident but difficult to actualise under current institutional regimes.<sup>45,46</sup> Current institutional regimes rely on the discount rate concept to operationalise a path to action, but are unsuccessful because they cannot rationalise the real risk of catastrophic outcomes, thus increasing the perceived uncertainty around the necessity of taking urgent action.<sup>47</sup>

### *Path dependence*

The role of path dependence in explaining institutional inertia is central to the historical institutionalist literature. Path dependence refers to the outcomes of “self-reinforcing or positive feedback processes” in a social system (Reference 12, p. 10). Mahoney<sup>48</sup> sees path dependence as encompassing many other mechanisms also identified in this review, including power and legitimacy. Although it is indeed possible to conceive of path dependence as ‘meta-mechanism’, Mahoney also reasons that path dependence generates a historically embedded inertia with its own particular “nature” (Reference 48, p. 511). It can therefore be argued that inertia generated by path dependence is different from inertia stemming from other mechanisms.

From the point of view of path dependence, inertia in climate change policy can be explained as the inability to change the paths of development due to the choices and decisions made in the past. This is for instance the case in a ‘technological lock-in’, where the relatively open futures of development are curtailed or closed down by the historical development and domination of carbon-based technology.<sup>49, 50</sup> The logical result of such a lock-in is the absence of political or technical support for change. Thus, current-day struggles over technological fixes in climate change policy are historically situated<sup>51</sup> and highlight that previously adopted technological innovations can create significant obstacles to institutional change.

The literature also contends that path dependence is not limited to technological systems. Path dependence relates to both formal and informal institutions, i.e. rules and laws as well as practices and routines. Burch argues that assemblages of technologies, artefacts, bureaucracies and worldviews inform the course and velocity of development paths, which in the climate regime implies that “inertia [is] inherent in practices, habits and institutional arrangements” (Reference 8, p. 181). By studying how transport planning in Australian cities addresses climate change, Low et al. argue that path dependence comes in three varieties: “technical, institutional, and discursive” (Reference 52, p. 392). The authors pinpoint that previous investment in carbon-based infrastructure was in fact not the prime driver of resistance to institutional change, but that this resistance was constituted by multiple sources of path dependence, such as the enduring dominance of discursive story lines of economic interest vis-à-vis ecological concerns.

In other words, path dependence can be identified in various contexts. With regard to climate change, institutional inertia “implies embeddedness – in social structures of relationships, power dynamics, meanings, and everyday practices that ‘hold’ institutional arrangements in place” (Reference 23, p. 1373). This embeddedness shows how policy paths sustain incumbent practices. This can for instance be discerned in Pulver’s<sup>53</sup> study of how major oil companies perceive climate change as a real-world threat to their interests. The variation can be explained by looking at how companies are “embedded in different scientific networks and policy fields” (Reference 53, p. 45), rather than by seeing it exclusively as a result of rational cost-benefit assessments. The close relationship between organisations and existing networks of knowledge and policy can thus demonstrate why some organisations are inert in responding to climate change.

### *Power*

Power and the formation of group affinity within multilateral climate change policy are popular within the new institutionalist literature.<sup>31</sup> One such factor is the unwavering support for the idea that nation-states are sovereign political entities.<sup>29</sup> Institutions have to reconcile the sovereignty claims of nation-states with framings of responsibility-taking and burden-sharing that persist in multilateral climate change negotiations. In this sense, the principle of ‘common but differentiated responsibilities’ in the

Kyoto Protocol could be construed as a trade-off among competing power coalitions.<sup>29</sup> As a precursor to expectations of benefits resulting from (non-)compliance, domestic institutional structures are apt to redirect courses or strategies for action by tailoring policy responses to 'the national interest' (see also Reference 54).

Concerning the political organisation of the nation-state, the system characteristics of the democratic polity become highly relevant. Liberal democracy has, by and large, been considered ill-equipped to address the urgency of climate change.<sup>19, 31, 55</sup> This is mainly due to temporal and spatial determinants of political preferences<sup>15</sup> (the 'present' and the 'nation-state', respectively), not to mention a general dislike for policy responses that need a long time to develop and pay off.<sup>31, 55</sup> Both the intergenerational and intragenerational struggle between groups in society is thus aggravated by the vested interests that some of these groups have in inaction.<sup>19</sup> According to Lijphart<sup>56</sup>, the vestedness of power can be explained by the organisational structure of democratic representation, particularly regarding multipartyism and multidimensional issue framing. Especially in Westminster democracies, the struggle between the traditional left and right over socio-economic issues contradicts the need to respond to more intangible policy issues, such as climate change.

However, power is not confined to the formal institutions of how politics is organised, but is also identifiable in the ways in which climate change is debated and framed. Studies emphasise that the state is not a singular actor with consistent strategies, but is instead comprised of power blocs that influence the course, direction and velocity of climate policy.<sup>57-59</sup> Actors within a corporatist state structure may negate the potential of subordinate groups to create substantive climate policy change by mainstreaming the normative dimension of emission reduction into strategic business management and the free market.<sup>35, 60</sup> This is seen as problematic for overcoming inertia, mainly because it leaves the economic drivers of climate change uncovered.

### *Legitimacy*

When problems are complex and clear guidelines for how to address them are absent legitimacy becomes important. A lack of legitimacy for policy action can explain much of why institutions are slow in addressing climate change.<sup>61</sup> Institutions establish standards of acceptable and suitable courses of action, as well as which policies are sustained or abolished. For example, Harries and Penning-Rowsell<sup>62</sup> highlight how local-level risk managers in England refused to adopt new climate change adaptation methods, as conventional methods are legitimised at the expense of newer ones. This refusal led to a decreased ability to address flood vulnerability, but instead strengthened the focus on customary flood defence.

Conversely, institutional change can be resisted by delegitimising new ideas and cognitive scripts. For example, Vasi has shown that in the US the efforts to address climate change through various city-level climate change programmes, such as Cities for Climate Protection, have been successfully delegitimised by the US government which sees them as "based on norms, values and expectations which are not appropriate and necessary features of local governments" as well as damaging to the national economic interest (Reference 63, p. 121). Depending on the interests of powerful actors, legitimacy can be used to both constrain and encourage institutional change.

Definitions of what conduct should be considered legitimate or 'appropriate'<sup>5</sup>, is enacted by actors with sufficient resources to do so. Institutions that are in active exchange with the broader social system, entangled in larger power webs, provide them with legitimacy.<sup>64</sup> According to Matthews and Sydneysmith<sup>64</sup>, the relationship between legitimacy and power can be distinguished in international climate policy, where dominant actors are able to legitimise policy tools that correspond to economic



interests rather than GHG emission mitigation. This can be illustrated by the development of flexible mechanisms within the Kyoto Protocol, including Joint Implementation (JI) and Clean Development Mechanism (CDM). It is argued that they reinforce the legitimacy of “economic growth” and “liberal trade” in climate policy by supplying signatories to the protocol with flexible choices for implementation (Reference 11, p. 210).

## DISCUSSION

Although the five mechanisms of institutional inertia appear in the text as distinct from each other, it is evident that they are interlinked to a large degree. For example, both legitimacy and power are coupled when studying who has the means to legitimise or delegitimise institutions. In other words, legitimisation processes are dependent on existing power relationships. Furthermore, power and legitimacy link up to path dependence, for the historical choice for a particular path is legitimised by powerful actors. Because of the uncertainties relating to the outcomes of climate change, actors apply various methods and framings to address the problem. The different methods and framings enjoy variable amounts of legitimacy, which in turn is linked to the costs of policy implementation.

Nevertheless, it is useful to analytically separate the five mechanisms, as they also by themselves constitute the very means that generate institutional inertia. It is also important to stress that the mechanisms are linked to specific types of institutions and strands of new institutionalism – e.g. legitimacy is closely related to SI and path dependence to HI. This highlights that depending on which theoretical approach one adopts, the causes of institutional inertia often tend to be conceptualised in a specific way. Table 1 has summed up the mechanisms and their implications for actor behaviour and climate change policy. We concur with Hall and Taylor<sup>24</sup> that behaviour is an intrinsic component of policy, subsequent to institutional change or inertia. Reflecting a mirror image, Table 1 also demonstrates how inertia might be overcome by addressing the main institutional constraints in each mechanism.

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As the mechanisms draw upon the theoretically diverse new institutionalist literature, the means to address inertia will similarly be dependent on the theoretical approach one adopts. Although the RCI literature tend to prioritise agency and individual behaviour over institutional influence, and thus envisage institutions as mere vehicles for collective action, within the HI and SI camps the tendency is the opposite.<sup>24</sup> However, attempts to bring these approaches closer to each other have lately gained interest amongst institutionalist scholars. A popular example of this is the research on ‘institutional entrepreneurship’ and ‘institutional work’.<sup>65-68</sup> In short, where the former focuses on agency that leads to institutional creation or change, the latter is concerned with a wider range of forms of agency, including the ‘maintenance’ of institutions as well as cases where entrepreneurship fails. Institutional work and entrepreneurship emphasise that although actors are institutionally situated, they are nevertheless capable of acting strategically in creating and changing institutional settings.<sup>69, 70</sup> This research can therefore be seen as an attempted synthesis of the three strands of new institutionalism, where the preferences and behaviour of actors are neither fully socially defined nor independent of the social context.

The focus on agency can also be identified in the new institutionalist literature on climate change. For example, Wijen and Ansari<sup>69</sup> utilise the concept of ‘collective institutional entrepreneurship’ to study the creation of the Kyoto Protocol and highlight several drivers that can break institutional inertias.

These drivers include amongst others: power brokerage; devising favourable cognitive frames for change; and crafting incentives for lowering transaction costs. By combining the work on institutional entrepreneurship and windows of opportunity, Buhr<sup>71</sup> has studied the inclusion of aviation in the European Union Emissions Trading Scheme (EU ETS). The change in the EU ETS was possible because institutional entrepreneurship was coupled to three main temporally specific factors: at the time of its inception the EU ETS was politically legitimate; climate change was acknowledged as an important policy issue; and the political support for including aviation was strong.

The study of agency in climate change policy can also be found in the transnational relations literature. This field of research focuses on the role of transnational advocacy networks<sup>72</sup> in influencing international climate agreements and more broadly transnational climate governance.<sup>73</sup> Schroeder shows that the means of indigenous peoples to influence international climate negotiations through nation-states have proven difficult, as they are dominated by “[t]he interest of the powerful elite” (Reference 74, p. 329). Yet, they have been able to gain influence through various transnational advocacy coalitions including environmental non-governmental organisations (ENGOS) operating at the international policy level. Agency ‘beyond the state’ can thus enable diverse avenues for overcoming structural barriers of change.

Interestingly, path dependence has also been prescribed as a potential means to address institutional inertia. For example, proactive policy-makers may nurture “countervailing policies that might trigger path-dependent ‘low carbon’ trajectories” (Reference 15, p. 124), which drives future policy choices to mitigate GHG emissions. Urpelainen<sup>75</sup> has shown that future climate change policy choices will follow the logic of decisions made in the past. When ‘green’ governments opt to implement mitigation policies and are in addition willing to invest initial capital, it may become too expensive to dismantle such policies at a later stage. As a consequence, successor ‘brown’ governments are compelled to sustain the policies because of an improved cost-benefit ratio. However, the success of ‘using’ institutional inertia for cementing climate-friendly policies ultimately depends on the capacity of actors to initiate these institutional changes. This is why a focus on agency in institutional arrangements is crucial, especially when studying the need for new paths within climate change policy.

Focusing on the specific practices and processes that may, or may not, initiate institutional change enables for a more comprehensive view of the relationship between institutions, on the one hand, and individual and organisational behaviour, on the other. Here, the mechanisms of institutional inertia presented in this review article become valuable, as they highlight areas where the study of agency, either in the form of institutional entrepreneurship or beyond, can potentially address the urgency of climate change.

## **CONCLUSION**

Climate scientists have repeatedly called for urgent mitigating action in order to avoid the most adverse effects of climate change. However, within the political arena these actions are largely lacking. Therefore, identifying the structural barriers to change as well as devising possible solutions to overcome these is of great importance. In this review article we have studied the ways in which institutional inertia is depicted in the new institutionalist literature on climate change. Institutional inertia refers to the ‘stickiness’ of institutions, or the tendency of institutions to move slowly and resist change. New institutionalism is a popular field of research that places emphasis on the irreducibility of social problems to the individual, thereby highlighting the role of the more structural traits of problem-solving.

Based on our review, the new institutionalist literature is a useful tool for providing explanations for the slow movement of institutions in climate change policy. In our review we identified five main

mechanisms of inertia: (1) cost; (2) uncertainty; (3) path dependence; (4) power; and (5) legitimacy. Although the five mechanisms are presented separately, it is important to stress that they are closely interlinked and are indeed feeding back into each other, thereby rendering attempts to address these more complex. Overcoming the institutional inertias requires efforts on different levels and in various social fields. The contribution of this review article is that it scrutinises the concept of institutional inertia and its relevance for climate change policy, which can assist researchers making sense of the different explanations for policy inaction.

Bearing in mind the time lags existing in climatic and institutional systems, addressing inertias is of central importance for climate policy in order to address the urgency of climate change and to mitigate the most severe effects of climate change in a timely manner. The new institutionalist literature shows that the development of climate policy innovations is a comprehensive endeavour that encompasses the realms of resources, knowledge, norms, technological development and cognition. Putting institutions into the limelight thus enables for a more inclusive understanding of climate change policy dynamics. We urge future research to take seriously the role of agency within institutional arrangements. This can help us to pinpoint how instances of institutional inertia are both challenged and reproduced by actors in different institutional settings.

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## Tables

**Table 1.** The mechanisms of institutional inertia and implications for the climate regime.

<b>Mechanism of institutional inertia</b>	<b>Types of institution experiencing inertia</b>	<b>Implications for behaviour</b>	<b>Implications for climate change policy</b>	<b>How might inertia be overcome?</b>
<i>Costs</i>	Rules and laws that guide the coordination of actors	The costs of mitigating action withdraw actors engagement in climate change	Risk of free-riding and transaction costs prevent collectively optimal decisions in climate change policy	Creating incentive systems that lower transaction costs for institutional change
<i>Uncertainty</i>	Definitions of climate change and its influence on society	Uncertainty inhibits actors to fully grasp the impacts of climate change	The challenge of defining climate change as a problem and estimating its impacts delays policy action	Devising favourable frames for change aiming at reaching consensus among political actors on climate change
<i>Path dependence</i>	Organisational structure of the polity as well as rules and routines guiding technological development	Actors have limited possibilities to devise strategic alternatives to the existing path of development	Lock-in of technological systems and routines tied to the status-quo hinders the switch to new paths	Mobilising actor(s) with sufficient power to create new paths for institutional innovation; Using path dependence to institutionalise low-carbon trajectories
<i>Power</i>	Organisational structure of the polity as well as framing of climate change	Existing institutional structures facilitate incumbent actors; Insubordinate groups are hindered to exert pressure	Powerful actors resist calls for quick fixes in climate policy because they challenge actors' self-interest	Power brokerage between powerful actors; Forming coalition of regime-changing actors in the international political arena
<i>Legitimacy</i>	Rules, norms, routines, cognitive scripts and standards for behaviour	Current practices are sustained, as they are considered appropriate by actors	New policies that do not enjoy acceptance are delegitimised and objected against	Increasing legitimacy of innovative policies and institutional pathways by doing boundary-work and political bargaining

### Further Reading/Resources

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